ITEMS OF INTEREST.

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Shots from the Profession.

HUMAN PHYSIOLOGY.

BY L. ASHLEY FAUGHT, D.D.S.

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(CONCLUDED FROM PAGE 392.)

The study of absorption is not complete without knowledge of the origin, composition, and function of lymph and of chyle. Of lymph, because it is the normal circulating fluid of the lymphatic system, and an examination of it may be expected to reveal the necessity for such vessels; of chyle, because of its periodical occurrence in a restricted portion of the lymphatics, and because it exerts, temporarily, a modifying influence on the nature and composition of lymph. Lymph, therefore, is of first importance, and the primal fluid; chyle is but lymph plus other products.

It is a remarkable fact that the composition of lymph, and of the great circulating fluid of the body—the blood—is nearly the same. All the constituents of the blood except the red corpuscles, exist in the lymph, the only difference being in the proportions which they hold to each other. Lymph consists of a plasma, and morphological elements. This plasma coagulates promptly when out of the vessels, but rarely, if ever, within them, notwithstanding the sluggish movements of the fluid. Lymph is transparent or of slightly yellowish color, and becomes faintly red on standing, which change in color has been shown to be due to the existence of a few red corpuscles. The origin of these red corpuscles in this relationship has been much discussed. From their constant presence in lymph or chyle discharged from fistulous openings, it is believed that they are normal constituents, and this view is favored by those who suppose them to be formed out of leucocytes. Robin, however, denies that this may be so, and gives as his reason the fact that red corpuscles are never found in lymph obtained from a portion of a vessel included between two ligatures. On account of this statement, if it be true, and for other reasons, it seems correct to look upon their

existence as accidental; and upon the blood as their source of derivation.

Human lymph has no odor, is saline in taste, with a constantly alkaline reaction. Its specific gravity is lower than that of the blood,—1007. The quantity is stated variously, but the average indicates six to six and a half pounds to be the amount in a man weighing one hundred and forty pounds. Chemical analysis shows it to be composed of

Water,	937.32
Fibrine,	.60
Caseous matter, (with earthy phosphates and traces of iron)	42.77
Fatty matter,	6.51
Hydro-alcoholic extraction,	12.80
	1000.00

The most important of the morphological elements in the lymph, is the lymph corpuscles. Though less uniform in size and appearance, they are generally looked upon as identical with the leucocytes found in the blood. Their average diameter is 1-2500 of an inch. They present an adhesive character, and are often found in masses, being more abundant in the larger than in the smaller vessels, and particularly numerous in vessels coming from glands. In deciding the origin of these lymph corpuscles, the following facts are to be taken into consideration: It has been shown that leucocytes exist in the blood of the embryon before a lymphatic system is formed; that they are quite abundant in lymph which has not passed through any glands; that observations are said to have been made of spontaneous formation in an amorphous blastema; that, in lymphatic glands, corpuscles of various sizes and with dividing nuclei are seen; and that, in the disease leuchaemia, the spleen and lymphatic glands are enlarged. The inevitable conclusion from all this is, that nearly, if not all of the lymph corpuscles, are developed by genesis in clear lymph plasma; and that the lymphatic glands, although not their special formative organs, do greatly promote, in some way, such production.

The function of lymph corpuscles is obscure. They pass into the blood, and form a constant constituent. It is possible they are changed into blood discs. Aside from this, there appears to be no physiological office.

The important constituents of the lymph plasma are undoubtedly obtained from the blood only; and this by endosmotic and exosmotic currents in the many lymphatics which surround the blood vessels in various portions of their course. It is an important physiological fact that there constantly exists in lymph a large proportion of urea. This substance cannot be derived from the blood, for its amount here exceeds that in the blood, notwithstanding it is constantly discharged into the blood vessels. It comes from the tissues, as the result of a direct transformation of the nitrogenous matters of daily food, and from the metamorphosis of the more permanent constituents of the

body, goes to the blood, is thus swept on by its current to the kidneys, by which it is removed from the system.

As far as can be determined from the limited facts now known, the function of the lymph is, in great measure, to remove from the tissues the products of decay of the organism.

In a fasting person, and during the interval of digestion, the intestinal lymphatics and the thoracic duct carry only ordinary lymph, but as soon as the process of digestion delivers to these absorbent vessels material prepared for nutrition, they seize upon it, and, becoming filled with it, their contents is known as chyle. The composition and properties of this substance, in the main, have already been described. It is well, however, to consider it briefly in the aspects presented as a distinct fluid of the economy.

Chyle is a white, opaque, milky fluid; slightly saline in taste, with an odor varying largely with the nature of the diet, and the class of animal from which the fluid is taken. The reaction is alkaline or neutral. The specific gravity varies greatly, though generally stated to be 1024. Like lymph, it speedily coagulates outside of the vessels. Its chemical composition is

Water,	904.8
Albumen with traces of fibrinous matter,	70.8
Aqueous extractive,	5.6
Alcoholic extractive,	5.2
Alkaline chlorides, carbonates and sulphates,	4.4
Fatty matters,	9.2
	1000.0

The movement of the contents of the lymphatic vessels is feeble, irregular, and subject to frequent interruptions. Various influences combine to produce this motion. Unlike the venous circulation, it is not the result, principally, of a propelling organ centrally located. Its *vis a tergo* is, however, as irresistible a power—the forces of endosmotic and transudation. This propelling power is in a constant state of activity, and originates at the periphery, where the wall of the plexus is thin, and the extent of absorbing surface great. There are other forces which more or less modify this one, and accelerate or retard the current; such as the influence of the contractile walls of the vessels; the pressure upon them from surrounding parts, caused by the contractions of the ordinary voluntary muscles, or the result of the pulsation of the large arteries situated against the lymphatic trunks; and the influence of the movements of respiration.

The mechanism of this last operation is as follows: With each act of inspiration the thoracic duct becomes dilated and distended with fluid; at the act of expiration, in common with other parts contained in the thoracic cavity, it undergoes compression, the valves prevent any reflux of its contents, and the fluid is discharged into the left subclavian vein.

REPORT OF THE MEETING OF THE PENNA. STATE DENTAL SOCIETY.

[Held at Cresson, Pa., July 31 and August 1 and 2, 1883.]

BY DR. W. H. TRUEMAN, PHILA.—FOR THE "ITEMS OF INTEREST."

(CONTINUED FROM PAGE 366.)

DISCUSSION.

Dr. Magill favored a plate wherever it could be used. It distributed the strain better, he thought, and gave a better chance to readily change the direction of force. In connection with plates he used either wedges or springs. He had good results in moving teeth out, by taking an impression, and, after making the cast, scraping all the teeth a little at the neck, and the tooth to be moved, considerable. On this cast he made a simple vulcanite plate, leaving it a little thicker opposite the tooth to be moved. When made, the plate fits in tight, and pressed very hard against the misplaced tooth. In a few days, after the tooth had moved out a little, he warmed the plate opposite it, and with the pliers pressed it out so that it would again press hard against it—repeating this as often as needful. The smooth plate proved but little obstruction in the mouth, and formed an effective arrangement.

Dr. Guilford appreciated the value of the screw, and had used it in much the same way that Dr. Trueman had described, except that he preferred to make the bands wide and thin, and, instead of soldering tongues to them, he made sockets into which the nuts of the screw fitted. He then cemented the bands to the teeth with either oxychloride or oxyphosphate cement. He had found bands put on in this way and kept dry for five or ten minutes to hold very firmly. When the cement was hard he slipped the screw-jack in the socket and screwed it up tight. It was less labor, he thought, than soldering on tongues and soldering the screw-jacks to them. He had arranged them entirely by the mouth without making a cast. He also thought not being rigidly fastened to the bands a decided advantage. It also allowed the band on the tooth to be moved to be placed nearer the crown, and effectually prevented any injury to the gums. In the plan suggested by Dr. Trueman, and shown on the casts he exhibited, the band is placed at the neck of the tooth, where the force used acts with the least advantage. That he had been able to accomplish the results shown demonstrated the effectiveness of the screw. When he read the article of Dr. Farrar's referred to by Dr. Trueman, he had been much impressed with it, but since then he had been led to doubt the value of an intermittent force, and was inclined to think the freedom from pain and irritation was owing to the care taken to keep the appliance from pressing into and irritating the soft tissues. In Dr. Farrar's appliances, and also in those shown by Dr. Trueman, there would be very little risk of

any undue pressure upon the soft parts, and therefore but little irritation. Since the idea had been suggested to him by Dr. Magill, several years ago, he had abandoned ligatures, and in their place used thin platina or gold rings cemented to the teeth, soldering to them hooks or rings to which he secured springs cut from rubber tubing. These he was able to fix just where they were needed, and by securing them near the cutting edge, the springs rested on the teeth alone. Since he had adopted this plan, he had scarcely any trouble from excessive soreness of the teeth or gums. He had recently moved back a bicuspid, in a case where he had extracted the first molar. In that case he made a ring to fit the molar, and soldered a hook pointing back on each side, and fitted a similar ring to the bicuspid. When they were both in place he stretched a ring cut from regulating tube on each side, simply slipping it over the hooks. It worked quite rapidly and with very little pain. These rings may be kept in place as long as needed. They very seldom give way, and will be found very useful for many purposes. They are rapidly made; he took a strip of gold or platina, prefering the latter, and fitted it to the tooth in the mouth with a burnisher. Then marking with a point where the ends lap, removed and soldered it. For hooks he takes the headed pins from a vulcanite tooth; they are just what are needed, and, holding them in position, with a little plaster solders them, then cuts off the extra length and bends them into a hook. He had one objection to the arrangement shown by Dr. Trueman: he noticed that the fixed end of the screw was attached to only one tooth. No matter how firmly fixed the tooth might be—the strongest molar he had seen—he would never trust it alone unless it was a case where very little force was needed. He always distributed the strain at that point between two or three teeth. He would never think of doing as was done in the case shown,—attempt to draw in a canine with the other end of the screw fixed to a single molar. He thought there was great risk of injury and preferred to be on the safe side.

Dr. Trueman, in reply, said: In the case referred to, while the screw was only fixed to one tooth, the direction of strain was such that the tooth was supported by all the teeth in front of it on that side. In that case, as in the others exhibited, any addition to the band at that point would have been useless. In the case in question all six of the lower front teeth were so far out that they antagonized outside of the upper teeth. The arrangement shown had been used to draw in the lateral and central of that side; a similar arrangement had been used on the other side, and the teeth had been successfully brought into position. The molar had resisted the strain of bringing in both teeth at once, and had sustained no injury so far as he could see. The arrangement shown had been altered to act upon the canine, but before it could

be applied the patient was taken sick, and when she next presented, some six months after, the canines had so far changed their position that it was deemed best to let them alone. The teeth had proved very difficult to regulate, owing, no doubt, to the patient's age, about twenty-seven. In some cases it is best to include several teeth, but in others it would only complicate matters. In regard to cementing the bands in place, he doubted whether it would answer. It might, if they were made with sockets, as Dr. Guilford suggested. That was a good idea, if practical. He had tried it with the bands soldered to the screws, and it did not hold. He had tried to hold the bands in place with ligatures of gilling twine, wire, etc., but they would not hold against the force needed to turn the screw. He had used bands such as described in many cases, and always with success. The space required by the bands described by Dr. Guilford was an objection to their use in very crowded mouths, and, also, the teeth did not slide over them as readily as they would over each other. The narrow bands at the necks of the teeth took up no room, and if carefully arranged could be made to act as wedges, so as to facilitate the teeth passing each other. There are many cases where bands cemented on the teeth were very useful. Dr. Guilford had suggested it to him some years ago, and he had frequently used them to advantage.

SECOND DAY, AUG. 1—MORNING SESSION.

Dr. Darby, Chairman of the Committee to prepare resolutions on death of Dr. Marshall H. Webb, presented a report, which was accepted and ordered to be entered upon the minutes.

Dr. Magill presented a report of the Committee on Enforcement of Dental Law. They had prosecuted one case to a final issue. The verdict was against the defendant, who afterwards attended a dental college and graduated. The committee desired to have the sense of the meeting as to whether the term of pupilage should be counted as "time of practice." A case had occurred where the attention of the committee had been called to a dentist who was violating the law. The committee notified him and he replied that the law did not apply to him; he was still a student. Several years passed and he then claimed that he had been in "practice" all that time, and was exempted. The law does not say how long a man may be a student. Now, can a dentist continue to practice year after year and escape the penalty of the law by claiming to be a student as long as it suits his purpose, and then turn round and claim all that time as having been spent in practice? The committee had found this a knotty question, and desired light upon it.

Dr. Jack moved that the period of pupilage should *not* be considered

as time spent in practice. After a discussion, the motion was passed unanimously.

Dr. Jack, after explaining that the State Examining Board was appointed to meet the case of those who were in practice before the dental law was passed, and that their certificate was not intended in any sense to take the place of a regular diploma, and that complaint had been made that their certificate was too easily obtained, moved that a committee be appointed by the president to confer with the Examining Board, to devise, if need be, rules and regulations to make the certificate of qualification more difficult of attainment. Passed, and committee appointed.

Dr. Jack, after reading the clause in the constitution referring to patents, (Art. 7, Sec. 2) said he thought the time had come for the profession to take a firm stand against all secret preparations. He did not desire to deny to any one the just reward of their labor; no one could object to a dentist manufacturing and selling a preparation, or a filling material, or a remedy he may have invented, but he thought we should take the same stand the medical profession has, and insist that the formula, and the process, shall first be published. These secret preparations were a hindrance to our professional progress, and, in the end, a serious injury. A dentist may, after a great deal of research and experiment, devise, say, an amalgam far better than any that has preceded it. If the formula and process were published, another knowing how it was produced may suggest a little change and make it still better. When it is kept a close secret it compels all investigators in that field to go over the same ground and to try the same fruitless experiments before any advance can be made. He considered them more objectionable than patents; the patent simply reserved the right of control over the thing patented, but prevented no one taking up the idea and improving it, but keeping the idea secret, does. He then offered resolutions disqualifying anyone from becoming or remaining a member of the society who had a pecuniary interest in any secret stopping or therapeutic agent, and denying representation to any college, if any teacher connected with it had such an interest in a secret preparation.

Dr. Guilford did not think it right, if one teacher in a college violated the rules of the society, to punish all the others for his fault; he was fully in accord with the first part of the resolutions, but thought the latter part unjust.

Dr. Magill said that a law could only be enforced so far as it met public sentiment. He thought the constitution went as far as the sentiment of the society called for. A man had a right, a personal right, to the result of his own labor, that should not be interfered with.

After a long discussion, the resolutions were passed.

[TO BE CONTINUED.]

THE BRAIN.

BY W. K. LADUE, ALAMEDA, CAL.

The brain, or encephalon, is the most important nerve center of the body. It is composed mainly of the *cerebrum*, *cerebellum* and *medulla oblongata*, (or oblong marrow, the upper enlarged portion of the spinal chord) and is enclosed by three membranes, the *dura mater*, (or hard mother) the *arachnoid*, (or spider-like) and the *pia mater* (or natural mother, so named because it infolds the brain as a true mother does her child). The *dura mater* and *pia mater* were supposed, by the Arabians, to be the origin of all the other membranes of the body, hence the name *mater*, or mother.

On the surface of the brain is a gray, vesicular nerve matter, the layers of which, in infancy, are comparatively symmetrical and smooth; but in manhood they are very much convoluted or rolled together, so much so that, were they spread out, the surface covered would be nearly seven hundred square inches. The ratio of this convolution to brain weight, in the healthy individual, as a rule, denotes a corresponding increase in nervous power.

The center of the brain is mostly white, fibrous nerve matter, which seems to be nothing more than a medium for the transmission and reception of impressions by the gray nerve matter.

About seven-eighths of the substance of the brain is in the cerebral hemispheres. Each hemisphere is divided into three lobes, so that, in the entire cerebrum there are six lobes, two anterior, two middle, and two posterior.

The powers of the intellect are supposed to reside mainly in the cerebrum.

Animals from which this organ has been removed preserve the involuntary motions of the body, and, according to very good authority, retain the special senses of feeling, hearing, seeing, and, probably, those of tasting and smelling. A frog in this condition, when thrown into the water, will swim until exhausted or opposed by some obstacle. A pigeon, in the same state, will sink into a stupor, showing a loss of instinct and voluntary motion, but retaining the general use of its muscles.

From the pathological condition of the brain or encephalon, observed in man, the faculty of articulate speech is thought to reside in the left anterior lobe of the cerebrum. The left hemisphere of the cerebrum is found to be slightly heavier than the right, and it has superior circulation, which conditions furnish us with another reason why the greatest power should be propagated from this side. From the fact that some men retain the power of speech when the left lobe has been injured, it has been thought that originally this faculty resides in both the left and

right anterior lobes, and is generally transferred to the left lobe because of the reasons before mentioned, but when the circulation and other conditions are favorable, it may be transferred to the right lobe.

The cerebellum probably presides over co-ordination of the muscles. Its destruction does not materially injure the intellect, but seriously interferes with the regularity of muscular action.

In the adult man the average weight of the brain is about forty-nine and one-half ounces, and in the adult woman about forty-five ounces. This is more than in any of the animals, except the whale and elephant. The proportion to the weight of the body is one thirty-sixth part. Some animals have a higher proportion, but the increase is not in the cerebrum, the center of intellectual power, but in the sensory ganglia, at the base of the brain and in front of the medulla oblongata, the seat of the instinctive actions.

The *pia mater*, which directly covers the brain and is the medium of nutrition to the nerve substance, and the arachnoid membrane, are subject to inflammation in *cerebral meningitis* (inflammation of the membranes of the brain); but the *dura mater* is rarely involved. This disease is very fatal.

Hemiplegia, or paralysis of one side of the body, may result from disease of the opposite side of the cerebrum.

Sudden and active congestion of the brain may give rise to apoplexy; or an apoplectic attack accompanied by paralysis of the muscles of the limbs and face, on one side, may result from hæmorrhage into the substance of the brain.

Other affections arise from deficiency in quality or quantity of blood, and from mechanical injury.

By the aid of advanced scientific knowledge, and increased facilities for observation, men have discovered a large proportion of the effects of the one great *cause*. As they approach this, they must acknowledge their ignorance. The heart beats; supplies the marvelous laboratory of the lungs with blood for purification, and the entire system with life-giving power. But what *is* the prime cause of its action? We can discover the movements of the nucleolus of the bioplast. But what *causes* its movements? We think, and, through the brain, act. But what human mind can explain how a spiritual entity reveals itself through a physical entity? Verily, "He that created the heavens, and stretched them out; He that spread forth the earth, and that which cometh out of it; He that giveth breath unto the people upon it, and spirit to them that walk therein," is the one omnipotent, omniscient, immutable and eternal intelligence.

The brain is nought but the fine dust of the balance, in comparison to the works of His power.

Oliver Wendel Holmes has well said: "Our brains are seventy-year

clocks. The Angel of Life winds them up once for all, then closes the case, and gives the key to the Angel of the Resurrection. Tic-tac! tic-tac! go the wheels of thought; our will cannot stop them; they cannot stop themselves; sleep cannot stop them; madness only makes them go faster; death alone can break into the case, and, seizing the ever swinging pendulum which we call the heart, silence at last the clicking of the terrible escapement we have carried so long beneath our wrinkled foreheads."

If this be but a part of the creature, what must be the whole? And if the wonders of the creature be past finding out, what of the Creator?

[We like the plain, terse, practical style of this article. Though Mr. Ladue is without any professional title, we shall be pleased to receive more from his pen.—ED.]

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

Pursuant to a call by the secretary of the conference of State Boards of Dental Examiners, held at Lexington, Ky., in February last, Vermont, Iowa, Indiana, New Jersey, Pennsylvania, Ohio, Michigan, Illinois and Georgia were represented. The following constitution was adopted:

1st. This organization shall be known by the name of the National Association of Dental Examiners.

2d. The objects of this association shall be to secure, through the operation of the various State examining boards, a high and uniform standard of qualification for dental practitioners, and, so far as practicable, uniformity of methods in the working of these boards, and of legislation in creating them.

3d. This association shall consist of such different State boards of dental examiners as may elect to join this national association. They may be represented either by delegate or delegates, duly authorized, or by the whole board. Certificates from the proper officers of any board will be necessary to entitle such board to representation in this body.

4th. Each State board shall be entitled to ten votes, and in case the whole number of members of any board are not present at any meeting of the association, the whole number of votes of that board shall be equally distributed among and cast by those members of said board who are present.

5th. Each State board becoming connected with this association shall pay annually to the treasurer the sum of five dollars.

6th. The officers of this association shall be a president, a secretary and treasurer, the last named two offices combined in one. They shall be elected by ballot, without nomination, and shall hold their appointment for one year, or until their successors are elected and qualified. A majority of all the votes cast shall be necessary to a choice.

7th. The president shall preside at all meetings according to parliamentary usage as laid down in Cushing's Manual.

The vice president shall perform the duties of the president in case of the latter's absence or inability.

The secretary and treasurer shall keep correct minutes of the proceedings, give due notice of meetings, attend to the needed correspondence, and receive and hold all moneys belonging to the association, and from them shall pay all drafts of the president countersigned by the secretary. His accounts shall be audited by a committee of three appointed annually for that purpose.

8th. All State boards belonging to this association shall be bound by its action so long as they continue members of it. Any board refusing to be bound by the action of this body shall from that time cease to be a member thereof.

9th. The representatives of five State boards shall constitute a quorum for the transaction of business.

10th. There shall be held annually a meeting of this association at such time and place as the association may determine. The president may call a meeting at any time during the year upon the written request of five State boards.

11th. Amendments to this constitution may be made at any annual meeting by the consent of all the members present. In case of any opposition, notification in writing shall be made of any such proposed change, and shall be laid over for one year for final action, when the amendment can only be adopted by an affirmative vote of three-fourths.

Following is the list of questions adopted by the National Association of Dental Examiners to govern all State boards belonging to the association:*

ANATOMY.

1 Name five of the principal tissues of the body.
2 Of what does the skeleton consist?
3 What is the immediate covering of the bones?
4 Name, locate and describe the muscles of mastication.
5 Name the bones of the face.
6 Locate and describe the maxillary sinus.
7 Name, locate and describe the salivary glands.
8 Give the origin and course of the nerves which supply the teeth.
9 Name the different parts of the vascular system.
10 Name two of the largest glands of the body.
11 Name the muscles which depress the lower jaw.
12 Name the facial muscles, giving their origin and insertion.

*[We doubt the policy of confining an examination to set questions, though they may be made as indicative of the general status of a student that he may be expected to attain. But certainly these questions are well chosen, and we hope in the near future to give a series of articles answering each one of these questions, for we believe they lay the foundation of a very judicious course of dental training.—ED.]

PHYSIOLOGY.

1 Describe the process of digestion.

2 Name and describe the digestive secretions.

3 What is the function of the liver? of the kidneys? and of the skin?

4 Describe the circulation of the blood and the physiological action produced by it.

5 Describe some of the changes produced in the air taken into the lungs by the process of respiration.

6 Give some of the sources of the carbonic acid exhaled from the lungs.

7 Name some of the chief functions of the nervous system.

8 What is reflex nervous action? Give example.

9 What cranial nerve, being a motor nerve at its origin, joins a nerve of sensation and becomes a nerve of special sense?

10 What reciprocal influences do the sensory and sympathetic nerves have upon each other?

HISTOLOGY.

1 From what class of tissues do tooth germs originate?

2 Give the minute anatomy of the three hard structures of the tooth and the order of their development.

3 Name and describe the structure of muscular fibre.

4 Describe the corpuscular elements of the blood.

5 Name and describe the layers of the mucous membrane.

6 Describe the nerve tissues.

7 Describe the formation and structure of bone.

PATHOLOGY.

1 What is disease?

2 Define the various stages of inflammation.

3 Explain the difference between caries and necrosis of bone.

4 Describe exostosis. What causes it?

5 What is the difference between fever and inflammation?

6 In what ways may inflammation terminate?

7 Describe the source and formation of pus.

8 Give the distinctive features of neuralgia.

9 What conditions of tooth pulp occasion pain.

10 Name the agents concerned in, and describe the process of dental caries.

11 Name and describe the common diseases of the gums.

MATERIA MEDICA.

1 From what sources are medicinal agents obtained?

2 Name six of the remedial agents derived from the vegetable kingdom.

3 Name six obtained from the mineral kingdom.

4 From what other sources are remedial agents or influences derived?

5 From what sources are the principal sedatives derived?

6 Name five valuable stimulants.

7 Name three efficient arterial sedatives.

8 Name and describe the action of two principal escharotic.

9 Name five important tonics.

10 Name in order of potency five of the leading poisons.

SURGERY.

1 What conditions demand surgical interference?

2 For what purpose or purposes are surgical operations performed?

3 What are some of the dangers to be feared from surgical operations?

4 What are the means employed for arresting excessive hemorrhage?

5 Describe your method of opening the maxillary sinus for treatment.

6 What operations are resorted to in treatment of neuralgia?

7 Describe your treatment for fracture of the inferior maxilla, between the cuspid and bicuspid tooth.

8 How would you proceed to reduce a partial or complete dislocation of the lower jaw?

9 Describe the operation for ranula.

10 What conditions of the maxillary sinus require surgical interference?

THERAPEUTICS.

1 What is therapeusis?

2 To what does prophylaxis refer?

3 What do you understand by abortive measures?

4 What is the object of palliative treatment?

5 What are the principles involved in the treatment of inflammation?

6 What is the best treatment for alveolar abscess?

7 In what cases may diseased tooth pulp be restored and preserved, and by what treatment?

8 Give treatment for simple inflammation of the gums.

9 Give the treatment for aphthous sore mouth and pyorrhea alveolaris.

10 Give a list of therapeutic agents valuable to the dentist in general practice.

CHEMISTRY.

1 What is an element?

2 How many elements are there?

3 What is a compound substance?

4 In what condition are elements found in nature?

5 What properties are possessed in common by nearly all the elements?

6 What element is found most abundant in nature?

7 For what element is there the most extensive affinity?

8 What classes of substances are the best conductors of heat and cold?

9 What are the chemical constituents of dentine and enamel, and what are the proportions of each?

10 What are the chemical constituents of saliva?

[TO BE CONTINUED.]

WHEN SHOULD WE EXTRACT?

BY DR. W. E. DRISCOLL, BEDFORD, IND.

ED. ITEMS:—From page 347 to 350 of your issue for September Dr. W. N. Morrison says that for years he has extracted teeth and roots only when they could be removed with the thumb and finger, and heartily wishes every dentist would adopt that rule. While he is on the right side, I think he goes to an extreme that is impracticable and injurious to those subject to such a rule.

What dentist of observation has not seen an entire side or half of an upper or lower maxilla of teeth preserved for years from approximal decay by one tooth having been extracted at the best time, while the opposite ones had many points of decay only because no tooth had been removed?

Take the common case of a superior cuspid erupting outside or inside the arch. To delay to extract until the obstructing teeth can be removed with the thumb and finger, is to refuse to give the patient the benefit of dental science. It is to give professional sanction to what we deplore so often as the result of the *patient's ignorance.* Timely extracting often remedies irregularities that, if neglected, will require an expensive course of treatment, and discomfort with a regulating plate and appliances. Many patients, rather than submit to these latter, allow the irregular condition to continue until decay and pain drive them to some one who will extract. Is the dentist justified in continuing such a condition on the ground of devotion to an ideal plan of practice? I think not.

A vast number of cases come to us with teeth so much broken down by decay that unless they are removed and artificial substitutes on plates supplied, there will be required a most tedious and expensive course of treatment, only to be renewed from time to time until the inevitable day of extracting, and artificial teeth come at last. Then the patient will upbraid the dentist for not rendering such relief at first.

Of children's teeth, Dr. Morrison says: "They will drop in their proper time, as do the leaves in autumn."

What dentist in full practice for a few years has not seen hundreds of "milk" teeth that gave no sign of dropping, though the permanent teeth were being crowded out of their proper position? Shall we wait for them to drop out in such cases? If any of us do we will find intelligent parents taking their children to the other man. That will bring ninety-nine of every hundred in the profession to a realizing sense of their duty. The idea of leaving pulpless roots to act as wedges to "increase the arch" is not justified by my observation. That the size of the arch depends upon the retention of deciduous teeth until the last moment, I do not believe. But that much irregularity results from neglect of extracting is known to any careful observer. The size

of the arch, as a rule, is regulated by the size of the jaws, the pressure of the lips and tongue. Ten times as many persons suffer in appearance from too prominent teeth as do from contracted arches or receding teeth. This is one leading reason why so many persons are so much improved in their facial expression by substituting artificial teeth. The feminine eye, so quick to discern any improvement in one's looks, notes these cases, hence the almost universal popularity of artificial teeth with women.

It requires much study and experience to decide when and where to extract to give the patient the great benefit which will often accrue from its right performance. Since extracting certain teeth at the proper time will reduce the amount of filling, and the patient will need to preserve those remaining, that may constitute an objection with some to the plan; but it is to be hoped very few are so influenced. To do their patients the most good, and protect their own professional reputation, I think the profession almost unanimously will refuse to adopt Dr. Morrison's suggestions.

JUST SO—WELL, NEARLY SO.

In the transactions of the Odontological Society of Great Britain, as reported in the medical press, Mr. Henry Sewill says: "There could be no doubt that caries itself is wholly due to the action on the teeth of the acid products of decomposition formed in the mouth, which permeate the porous enamel and acts on the dentine. It has also been lately shown that the progress of the disease is assisted by the proliferation of micro-organisms in the canals of the dentine, these organisms having themselves the power of introducing an acid secretion. It is not in any sense a constitutional, but a purely local disease."

After making due allowance for the mistakes and misrepresentations incident to reporting, these remarks show that Mr. S. is not far from the kingdom of truth. We are not ready to state so positively that these micro-organisms are capable in themselves of producing an acid *secretion.* Some have guessed that they develop an acid, and we have asked what acid. If they are organic at all, of course acids will result from their decomposition or putrefaction, but to tell us the acid is a *secretion,* direct from the living organs of the little bugs and bushes, is a step beyond the present demonstrations of science.

In the main, the remarks are very clear and truthful. In a special some time ago we referred to a little boy watching the maggots eating the carcass of his pet dog, and remarking that, it was not strange that he had died, having all these worms in him. The dog's carcass was disposed of very much more rapidly by the maggots coming to the aid of the putrefactive process. And the appearance of the decaying car-

cass was much modified by the influence of the little worms. On the same principle the character and appearance of the decay in the tooth are much modified by the action of the micro-organisms, and the process of disintegration is doubtless accelerated by them, nevertheless, their influence is nothing until the decay has begun. Every now and then we receive a letter asking if it will not do to compromise on a combination of the chemical and the germ theories. This is similar to the suggestion of years ago—when some one would find that constitutional conditions predisposed to caries, he would tell us that it was not chemical action alone that caused caries, but the chemico-vital theory was the true one; as if any one ever thought of ignoring vitality as concerned in the process. And now we know of no observer who has not, for years, recognized the influence of germs. But that these germs are capable of attacking and devouring well developed, sound, hard teeth, is not recognized by any that we know who are capable of making both a chemical and pathological investigation, and who have given the subject careful attention. A certain Yankee tells us *we have shown* the germs, and who denies; but what are they doing? Not devouring sound, properly developed, tooth tissue. And the best friend of the showman, in this case, regards him as neither an original investigator nor capable of being one on this subject. It is amusing to see men who can barely read look through a glass, and immediately set themselves up as authority in microscopy and pathology; and it is more amusing to see them recognized to the full extent of their claims by the toadies who are on the watch for something marvelous. And what if the germs have been shown? The little boy showed the maggots, as well; not killing the dog, but devouring dog tissue after it was dead.

The advocates of the chemical theory of decay have never thought of ignoring the influences of vitality and of organic textures. But it seems very strange that after so long a time, (short, though, in comparison with the time the other theory was universally recognized)—strange that even yet so few understand the principles of the chemical theory of decay. So many of them talk so indefinitely and in such a general way about the acids concerned in the process, as if even tannic acid were as likely to start caries as any other, that it is not strange that students are mystified, while those opposed to the theory scarcely know what they have to combat.

But the advocates of the germ theory are entangled amid still greater confusion, and are still harder to understand. "Mr. Jones," said his friend, "your clock doesn't keep good time." "It is an excellent time-keeper when you understand it," replied Mr. Jones. "When the hands point to twelve, the clock strikes three; and that means that it lacks just twenty minutes of seven." Perhaps the germ theory clock keeps good time when we understand its conditions.—Dr. Geo. Watt, in *Ohio State Joural.*

SENSATION AND MOTION.

BY LEVI C. LANE, M.D., PROFESSOR OF SURGERY.

In the economy of animal life nature has given two functions, viz., *sensation* and *motion*. In the archetype of the animal's tracing, like the leading lines, these stand boldly in front and tell the observer: Here is animated life! In Nature's logic these are the major and minor premises to which some living thing bears the relation of conclusion. Each of these, if not so familiar to us, would awaken in our minds intense admiration; but to touch and to feel have been seen so often by the mental eye that, like the sun, the star, or the cloud, they have long ago dulled the sensibility, so that though they rank actually among the most deeply veiled mysteries of our being, we never think of or marvel at them.

In the background of Life's picture are other lines or marks, less characteristic inasmuch as they are shared equally by plants and animals. These are the nutritive, the instruments of which in the plant are rootlets and leaves, whilst in the animal the rootlets of nutrition spring from the mucous surfaces of the stomach and intestines. The plant, in consequence of its nearly complete want of locomotion, is compelled to send out its radicles in quest of food in its immediate vicinity, thus differing from the animal that roams hither and thither in search of nutriment.

The line in the sketch representing motion, if generalization be strained somewhat, may be claimed by the plant, since some species do actually move their leaf stems. This motion, however, though we do admire it, is but a counterfeit and a mockery when compared with that movement, "so express and admirable," possessed by the animal. The shrinking, retiring bow with which the sensitive plant droops its leaves when jostled or touched is but a shadow when compared with true animal movement. Still there is enough of it to make an important breach in the wall that the naturalist would fain raise between animal and vegetable existence. Nature loves freedom, and scorns to abide in the narrow inclosures to which science would consign her; for though the containing wall be reared with faultless care, with the strength of adamant and the hardness of diamond, and the supposed captive be bound with iron fetters, yet Nature, Proteus-like, eludes the guards and finds a door of escape. On this account half the occupation of science is in making new deductive guesses and shifting her would-be enduring landmarks. Though the handiwork of Nature is usually marked by infinite simplicity, yet in doing her work she exercises so much quiet prudence that to detect a single one of her footsteps science must often take countless steps. Science, to encompass a minimum tract in the domain of Nature, often must needs use a chain, each

link of which represents a generation of men. Kepler, to discover the ellipse through which our earth annually moves, must guess a thousand times, and literally cover and re-cover the face of the heavens with diagrams. Again and again did he draw from the urn of knowledge ere he secured those combination keys which unlocked the gate of the skies and gave mankind the priceless jewels which hitherto had lain concealed there.

The animal sphere, less fortunate than the celestial one, yet awaits its Kepler. Diagram after diagram has been traced upon and again discarded. Bold hands have vainly essayed to draw from the sacred urn the key which may unlock the Book of Life; and links must yet be added to the chain that may successfully sound the deep sea of animal existence.

Near the close of the first third of this century great advancement was made in this department of knowledge: and perhaps it would not be presumption to say that one of its leading keys was found by Sir Charles Bell when he discovered and announced to the world that, from the front half of the spinal chord of the vertebrated animal, nerve chords spring which preside over motion, while from the posterior half arise nerves which preside over and are concerned in feeling. I think it may not be extravagant to say that this discovery gave to old medicine a new world, and is in rank scarcely secondary to Harvey's discovery of the circulation of the blood. Nature, in this case, only confessed her secret when subjected to the rack of torture; for the discovery was made by the cry of pain from the animal questioned.

In the origin of the nerves they are separated from each other by quite an interval, so that in the frog, pigeon, or any of the higher animals, when the spinal canal is laid open one can readily catch and compress the nerve. Thus, by pinching the anterior root, Bell found that motion was caused in the part supplied by the nerve; or if the posterior root was injured the animal gave signs of pain; and the separate functions were still more surely proven when the root was severed, since then palsy of feeling or loss of motion ensued according as section was made of one or the other. A short distance, however, beyond their origin, the two roots join, and the fibres of the two are inextricably intermingled. Thus motion and feeling are united in indissoluble wedlock.

When it is evident that ulcerated teeth must be extracted, it is cruelty to ask patients to wait till the inflammation has subsided. The extra "toothache" they are thereby forced to endure is needless. The pain of extracting at a future time will be but little, if any, less; out with it, and then both the ulceration and the inflammation it has caused will quickly disappear.

SURGICAL ANÆSTHESIA—INDICATIONS AND COUNTER-INDICATIONS.

TRANSLATED FOR THE "ITEMS OF INTEREST" FROM THE FRENCH OF DR. J. B. ROTHENSTEIN, IN HIS "TREATISE ON ANÆSTHESIA," BY A. N. ROUSSEL, D.D.S., BROOKLYN, N. Y.

We shall divide this subject into two parts. In the first we shall consider the operation in which it is necessary to employ anæsthetics, and the nature of the anæsthetic best suited to the operation; and in the second we shall study the physiological conditions which may become counter-indications to the use of an anæsthetic. When is anæsthesia indicated?

The advantages of anæsthetics in surgery are to-day so little disputed that it appears to us useless to refer to this question. It would be equally idle to enumerate the list of surgical operations where the use of anæsthetic agents is indicated. We will state only this general principle: No decidedly painful operation should be performed without an anæsthetic. This rule is subject to but few exceptions, to which we will refer a little further on.

Certain careful surgeons,—we might well say timid—frightened by the accidents imputed to the use of chloroform, never resort to an anæsthetic but for large operations, and think it useless to use it for operations of short duration, such as the extraction of teeth, the opening of an abscess, or a whitlow, etc. We dissent from this position, and the more so as we possess nitrous oxide gas, which produces a profound anæsthesia in a few seconds, and lasts but a short time. They tell us that chloroform has produced death in cases where it has been employed for trifling operations, such as in-grown nail, extraction of teeth, etc. That is possible, because chloroform is a dangerous agent that may cause death, whether it be used for small or large operations; but we think that no doctor has the right to inflict terrible pain upon his patients when he has an agent at his command as sure and as rapid of action as nitrous oxide gas. Do not the pain and the nervous shock which generally accompany surgical operations without anæsthesia constitute in themselves dangerous symptoms? Every time pain is excited in a certain region, a considerable amount of blood is attracted there, which may give rise to complications more or less serious. As regards the nervous shock that accompanies painful operations, so susceptible are some persons to it that it may become the starting point for very grave accidents. There are authentic cases on record of death following a dental extraction where no anæsthetic was exhibited. A great many persons, fearing the pain, refuse to submit to dental operations, and thus remain liable to the inconvenience and accidents which result from a bad dentition, carious teeth, etc. We have no need to remind practitioners of the trouble and grave accidents that take their origin

in the dental system—indigestion, abscess of the maxillary sinus, neuralgia, etc.

Nitrous oxide gas, which facilitates to such a great degree the extraction of teeth, renders the greatest service in general pathology, though our opinion is contrary to that expressed by Drs. Lallemand and Perrin, that the use of anæsthetics is indicated in all painful operations, whether they be of short duration or otherwise.

Outside of the pathological conditions we are about to consider, there exists but one formal and absolute counter-indication, and that is the refusal of the patient to submit to the anæsthetic—a refusal which might be overcome by persuasion, but never by any other means. *What are the morbid conditions that counter-indicate the use of anæsthetics?*

Age.—Writers on this subject have spoken of the influence that age may have, in certain circumstances, contrary to the ordinary use of anæsthetics. It is indisputable that infants are more impressible than adults, and yield much more easily to the influence of the anæsthetic agent. After a certain age children are always more or less afraid of the operation, and struggle in the surgeon's hands. The result of experience shows that the resistance and the excitable stage are always less than in the adult. Syncope is very rare, even in earliest childhood.

Our personal experience, as well as facts observed in the hospitals of Lyons, and in the greater number of the large cities of Europe and America, would lead us to the same opinion as Dr. Bonisson, who advises ether for children, as it is less active. In regard to nitrous oxide gas, its safety is as complete when administered to children as to adults. Dr. Colton has frequently given it to children two years of age for dental extractions and other short operations, and he observed no symptoms that would be likely to change the indication of this excellent anæsthetic.

Old age is no more a counter-indication to the use of anæsthetics than youth is. Every day we see aged persons submitting to the influence of ether or nitrous oxide gas, without experiencing the slightest ill effects. Moreover, of all the death cases we have been able to collect, that of no aged person appears.

Influence of sex—Pregnancy, Menstruation, etc.—It is entirely unnecessary for us to say that the influence of sex is absolutely nothing. Some authors have declared their opinion that the administration of an anæsthetic during pregnancy or menstruation might occasion ill effects; but their assertion is not based on a single fact. It is a simple supposition, which nothing justifies. We have administered nitrous oxide gas during menstruation and pregnancy, and have not had any catamenial accident. Dr. Perrin thinks that chloroform or ether administered during pregnancy might, by the extravagant movements caused by the ex-

citable stage, be productive of accidents in women predisposed to abortion. But that we believe to be an unfounded fear, and which entirely disappears, as it is possible to entirely avoid the excitable stage by the use of nitrous oxide gas. That is, however, a secondary question, as it is not the anæsthetic but the operation itself that is counter-indicated during pregnancy and menstruation. A great deal has been said lately relative to the influence of the operation on the pregnancy, but this question, of course, cannot be discussed in this article. Formerly, certain American practitioners wished to deny the benefits of an anæsthetic to women because certain women had experienced lascivious dreams and had orally uttered their fears. It is sufficient for us to cite this opinion to show its entire emptiness. Lascivious dreams are rare during anæsthesia, and more so in women than in men.

Condition of the Stomach.—A full stomach is considered by some surgeons as an express counter-indication against the use of anæsthetics. We think there is some exaggeration and unfounded fear here. It is evident that it is preferable to anæsthetize a patient who has fasted, but no serious accident happens from acting otherwise. If it is true that ether or chloroform used singly causes a patient with a full stomach to vomit, by using the nitrous oxide gas this inconvenience disappears.

Pathological Conditions.—All authors who have written on the subject of anæsthesia agree that the influence of certain morbid conditions constitutes an absolute counter-indication, but we think, nevertheless, a certain number of diseases that have appeared in the list of counter-indications should be dropped. We will enumerate the diseases which, according to our opinion, have a real importance in the question before us:

Diseases of the Circulatory and Pulmonary System.—All organic diseases of the heart or lungs constitute a counter-indication to the use of anæsthetics. We do not state this as an absolute law, but we state our opinion that individuals affected with serious lesions of the heart and lungs are particularly liable to serious accidents. It would be easy for us to cite numerous conclusive facts to support this assertion.

Diseases of the Nervous System.—Organic lesions of the brain and medullary substance evidently constitute counter-indications to the use of an anæsthetic.

Alcoholism also appears to be an unfavorable condition, and writers on the subject report several cases of patients affected with delirium tremens having died during the administration of chloroform. Different nervous forms, (epilepsy, hysteria, etc.) though they appear but little favorable, do not, nevertheless, constitute counter-indications to the use of anæsthetics.

In the appearance of artificial teeth, naturalness should take precedence of beauty. Sometimes irregularity is better than mechanical accuracy.

THE USE OF THE SCREW IN REGULATING TEETH.

BY WILLIAM H. TRUEMAN, PHILADELPHIA, PA.

[A paper read before the Pennsylvania State Dental Society, at Cresson, Pa., July 31st, 1883.]

Although I had been quite familiar with the screw as used in regulating teeth for many years, and had made many appliances in which it played an important part, I was not impressed with its great value until I read a paper upon the subject written by Dr. J. N. Farrar, (*Dental Cosmos* for January, 1878) the second of a series in which he endeavors to reduce the use of the screw in regulating teeth to a system, and to devise a series of appliances that would meet all cases. I think, perhaps, that attempt, and the numerous complicated and delicate devices suggested, have tended to obscure the advantages of the screw as set forth in the paper referred to.

The idea that impressed me so forcibly in Dr. Farrar's paper was the advantage of a *positive* and *intermittent* force in regulating. To me it was new, and until I read it there I have no recollection of ever having seen it mentioned, or ever having seen any appliance made with that end in view. Until then the screw was mostly used to follow up the movement of the teeth, the real moving force being some form of spring or the force of mastication. It is true there were on the market several forms of steel jack-screws designed for regulating. I have been unable to learn the views of those who invented them, but gather from the advertisements that they were designed simply as a convenient means of applying force, and I think we may safely say that Dr. Farrar deserves the credit of demonstrating that the idea so long held, that the force used in regulating teeth should be a constant and yielding one, of which the spring is a type, was wrong, and that the screw, exerting a positive, unyielding and intermittent force, is by far the most effective and least painful.

I do not agree with Dr. Farrar when he limits the movement of the tooth to a small fraction of an inch every twelve hours. I find no rule can be rigidly laid down ; it is simply a matter for judgment. A rate of progress that in one case would be excessive, in another would be unnecessarily tedious.

Neither do I agree with him in applying the screw in all cases. There are many that can be more satisfactorily regulated by other means.

My object in bringing this subject before you is to show the advantage of the screw in cases where other means would probably prove cumbersome and inefficient, and to show you that the apparatus may be simple, easily made, easily altered, inexpensive and effective, working rapidly, and with a minimum of pain and inconvenience to the patient.

First, the advantage of the screw. It is a positive motion; if it is moved one quarter of a turn the tooth *must* move a corresponding distance, for it is not dependent upon any action on the part of the patient. It is an unyielding motion; the tooth is moved and held firmly in its new position, and is not disturbed again for hours. That is the secret of its painlessness. It is not like a spring, that, when it has moved the tooth allows some other force to move it back, and thus, by a to and fro motion, sets up severe irritation. It holds the tooth so firmly that in the most severe cases of interlocking there is no need of capping any of the teeth to keep the jaws apart. It works so rapidly that no injury need be feared from loss of antagonism while the tooth to be moved is taking its new position.

I use the new style steel screw-jack, suggested by Dr. A. McCollum, and kept in stock at the dental depots. It consists of a middle bar, which comes in several lengths, with a right and left hand screw and nut at either end. The nuts are intended to rest against the teeth, and are furnished with holes so they can be tied in place, though I do not think that plan a good one. I have found that wherever the steel touches the tooth, whether the contact be a forcible one or not, the enamel is *always* roughened. To avoid that, I always coat with soft solder or tin any part of the steel that may possibly come in contact with the teeth. I desire to lay particular stress on this, as I have seen teeth seriously injured by neglecting it.

The chief difficulty found in using this screw-jack is to hold it firmly in position. It must not only be firm enough to hold its place while at work, but also must be so fixed that the force used to turn it shall not displace it. The force required to turn the screw is far greater than might be expected. No matter how easily the screw may work at first, after it has been in place a short time and becomes oxydized, as it always does, it works stiff, and in some cases the force required to move the tooth is quite formidable, so that both combined make it necessary that the apparatus be held in place firmly. This is important, for if the apparatus is displaced, if it comes off and is immediately replaced, we may expect to lose a day's work. With the screw working so rapidly, repair does not follow the tooth so closely as with slower methods, and as soon as the pressure is released it immediately springs back. I find, as a rule, on replacing the apparatus we can only get the tooth into the position it was before it came off. For the same reason, after the work is done the tooth must be held in its new position more firmly and for a longer time than with other methods. In practice it is best to move the tooth a little beyond the desired position, and to allow the screw to remain in position for a week or more undisturbed, before replacing it with a retaining apparatus.

As each case requires its own special appliances, I can only give an

outline of the manner in which the screw is fixed in position. We first fit a band around the tooth to be moved, generally making it of platina-gold, as with it we obtain the greatest strength with the least bulk. If for one of the front teeth, we make it narrow, fitting it well down on the neck of the tooth, making it spring on tight, so that it cannot possibly slip over the crown. In putting it on, it is not, however, slipped over the crown, but pushed through the little space always found at the necks of the teeth, from the inside of the mouth. It is well to let the ends come well through, and to make them pointed, so that when in place they may be tightened with the pliers, as were the old-fashioned narrow bands on plates.

It may require a little tact to adjust it, but the most crowded mouths always have sufficient space for the band at this place. We now select the tooth or teeth to support the fixed end of the screw, and fit to them bands as wide as they will admit of, so shaping them that they will have a tendency to work up into the gum, and, after they are fitted, solder on little catches so as to hold them from going too far. We thus obtain a band that will remain firmly in position. It is best to have the band pass around the front of the tooth, and if the teeth are crowded so that it must be made thin, there is a possibility of its being pulled through, which must be guarded against. Where the bicuspids are selected it is best to use two of them; sometimes even three teeth are needed to resist the force used against the tooth to be moved. It is very needful that this end of the screw should be well supported. In some cases it may be necessary for the admission of the bands to press the teeth apart with rubber, but, as a rule, if made of thin platina-gold and the edge beviled, they can, with a little patience, be pushed up into place without separation.

The bands fitted, we solder to each, with silver solder, a tongue of heavy silver plate to support the screw, and, while soldering it to the front band, extend a tongue to rest upon the palatine surface of the tooth, so that the band shall not press into the gum too hard. These tongues should not conform to the roof of the mouth, but be made straight, otherwise when the tooth moves they will be pressed into the gum.

We are now ready to attach the screw. First enlarge the holes in the bar to at least double their size, so as to admit an instrument strong enough to turn it when in the mouth. Now file the nickel plating from both nuts, and so shape them that they will fit on the silver tongues snugly and present no sharp edges to the tongue, and then thoroughly coat them with tin, and also tin the lingual surfaces of the silver tongues. Now place the bands in position on the cast, lay the screw with the nuts in position, screwed up nearly as far as they will go, and, holding them in place if needful with a little plaster, thoroughly unite the silver

tongues and nuts with soft solder ; use it freely and be sure it takes hold well to avoid after trouble. The fixture is now complete. Before putting it in place oil the nuts and screw well ; the surplus may be wiped off, but be sure there is plenty between the nut and the screw, or after a few days it will be impossible to turn them. It is often difficult to fix it secure enough to resist the force needed to turn the screw, and it is generally best to support it with the fingers, and to examine closely to see that it is not displaced before dismissing the patient. In screwing up, turn gently and slowly and stop for a few moments if it goes hard ; each time screw up as far as the patient can bear, and then from ⅛ to ¼ of a turn more. The pain will cease in a few moments. It is better to go too slow rather than too fast, but that and many other little things are matters for the operator's judgment.

We generally arrange the fixture complete upon the cast, but sometimes it is best to fit the bands to the teeth in the mouth. After they are complete and ready to attach the screw, place them in the mouth and build up plaster in the space between them. We thus obtain a sure guide to get them in the exact position they should occupy.

If it is desired to pull a tooth in, we simply make the bands into loops. If the screw proves too short, change the position of the nuts, or use a longer bar.

It is said that there is danger that an appliance like this will irritate the periosteum, or make mischief by pressing down into the gum, and that there is great danger in moving a tooth so quickly. I admit that all this is true, but presume that those who attempt it are men of intelligence and judgment, and it requires but little of either to avoid any evil result. The inconvenience to the patient is far less than from any form of plate I know of. It is necessary to see the patient at least once a day, for I do not trust them to tighten the screw. I consider it less expense and labor to construct this appliance than to make a vulcanite plate. I have not attempted to explain how every case should be treated, but have simply given a general outline, believing that your own ingenuity will supply all that is omitted.

Dr. Geo. Watt says of Alcohol.—For more than a quarter of a century we have taught and have acted on the principle that alcohol is in no sense a stimulant. We have not used it even in extreme cases of hemorrhage, either in surgical or obstetrical practice. And as we have not lost a patient from hemorrhage, no one has been killed by its exclusion.

Some who make their own gas ask us how often the water containing the gas tank should be changed. We answer : Not at all. The water is so saturated by the gas that it remains sweet for years.

NITROGEN MONOXIDE.

A late work on anæsthesia, by Dr. Warin, furnishes the following statistics:

Cases of death by	chloroform, ...	73. in 152,260
" "	ether, ...	4. in 92,845
" "	nitrogen monoxide, ...	4. in 300,000

The last three cases, if I reccollect correctly, could not indisputably be ascribed to the anæsthesia produced by nitrogen monoxide, as in one of the three cases the cork used to keep the mouth open got into the trachea. Can there be anything more convincing than the above figures? In America, the Colton institution alone must have used nitrogen monoxide over 100,000 times, besides the reckless and promiscuous use by the ignorant as well as skilled, how many times the Lord only knows, and it is extremely rare to hear of a fatal case in this country. Still, in the face of the above statistics, you will find practitioners who will tell you that the use of nitrogen monoxide is dangerous.

But let us lay aside statistics, and show me the medical man who has not heard or read of numerous deaths resulting from the inhalation of chloroform. Now why is it we do not hear of the fatal cases due to the use of nitrogen monoxide? Let us admit that the responsible parties were interested in not having it published, would not the excitement occasioned by such a tragical occurrence be sufficient to make the matter public? Even public opinion seems to have settled the question that chloroform is more dangerous than nitrogen monoxide. Why, you will find that your patients will object to chloroform and ether, but that they are not only willing to take but ask to take "the *gas*."

Nitrogen monoxide does produce asphyxia, which may frighten some, but certainly without reason, because its administration is under perfect control; we can moderate or even stop its administration in time to prevent harm. Nitrogen monoxide occasions none of the dangerous phenomena of the brain and heart to which the use of chloroform is liable.

Anæsthesia is produced in two ways, one by a toxic effect upon the nerve centers,—and the agents which produce anæsthesia in this way are chloroform, ether, etc.—the other by asphyxia, that is by diminishing the quantity of oxygen in the blood, and the agent that occasions this result is nitrogen monoxide. According to the results of the experiments of Drs. Bert, Bedin and Coyne, that when the analyzed blood did not contain more than from two to three per cent of oxygen the animal could be punched and punched without manifesting the least pain, this is the anæsthetic period of asphyxia. If the experiment is prolonged, the insensibility remains and is followed by another sign upon which Dr. Bert lays particular stress—that is the dilatation of the

pupil. At this period the blood was again analyzed and he found the quantity of oxygen reduced to two or one per cent; in fine, when the proportion of oxygen was reduced to from 1 to .05 per cent the animal died.

You will appreciate from the foregoing to what extreme this condition was carried before death would occur. Therefore, nitrogen monoxide, when pure, is no poison. Being unfit for respiration, it asphyxiates, but it does not poison, and the patient, as soon as administration is stopped, begins to regain consciousness.

Chloroform does not asphyxiate, necessitating care in its administration, requiring to be mixed with air, and, what is worse, we are not able to foresee how each patient will tolerate it. It sometimes kills, and when it does kill it does it not by asphyxia, but without warning, and we are left helpless to afford the least relief for the unfortunate victim.

Nitrogen monoxide, on the other hand, the moment the mouth-piece is removed, the patient loses that cyanotic hue and returns to consciousness so rapidly that you have to operate in haste, and at the end of a few minutes the effect passes off entirely and the patient is able to go about his business, without nausea, headache, etc. Sometimes during its administration there is some nervous excitement, but it is generally of a very trivial character, and consequently occasions no alarm.

How different the phenomenon attendant upon the inhalation of chloroform! During the whole time of its administration is extreme anxiety. It does not produce cyanosis, but pallor, irregular and stertorious breathing, and a feebleness of the pulse. All of these symptoms are a source of uneasiness to the surgeon. Again, when the inhalation is stopped, the patient is slow to recover consciousness, and even when consciousness is regained every one is acquainted with the malaises, nausea, headache, vertigo—in fact, I could string out quite a list of the sequelæ.

All that I have said with regard to chloroform is applicable to ether, but in a more moderate degree—so, consequently, we must consider ether more dangerous than nitrogen monoxide.

The objection might be raised that the gas will not affect every subject; but the refractory patients are exceedingly rare, and, in fact, the gas has been used thousands of times at our office and I have failed to come across one. I admit that nitrogen monoxide is not as convenient of application as either chloroform or ether; but I think where human life is at stake that a trivial inconvenience would hardly warrant the use of a more dangerous agent. Besides, it can be had in the liquid form in cylinders of 100 to 500 gallons, reducing the difficulty of transportation and application to a minimum.

Gentlemen, it is my honest hope that I will see the day when nitrogen monoxide will be the agent for all the operations of minor surgery, which are by far the most frequent. Although it is not as convenient of application as either ether or chloroform, still the security which the agent affords will, as soon as it shall become better known, cause it to become the universal anæsthetic for all operations that do not require time for their performance.

Before concluding, I would beg to remark that, in my humble opinion, a rash use of the gas should be avoided; and I would state that the only conditions wherein the gas would be contraindicated would be: First, in grave lung trouble, and, second, where there is an organic lesion of the heart. I would advise to always examine that organ previous to using the gas. If you should be unable to do so, at least feel that the pulse is regular; and should you not be satisfied with that, send your patient to his family physician and have him express his opinion of the fitness of your patient.

With the foregoing precautions this agent can be used without danger, and with a perfect assurance that no ill effects will follow its administration.

THE GRINDSTONE CURE.

BY JOS. REQUA, ROCHESTER, N. Y.

A peculiar phase of periostitis, with accompanying discomfort and toothache, has so forced itself upon my attention the past year and has been so interesting to me, that I wish to call your attention to the subject, and will do so by giving the history of a few cases.

The teeth and their surroundings to be maintained in health need exercise, such as they get or ought to get in the mastication of food. In order to get this exercise they must have antagonists. Usually, when a tooth has lost its antagonist, we see it slowly and surely losing its firmness and becoming elongated, or leaving its socket. On the other hand, it must not be subjected to immoderate usage and pressure, such as a molar or bicuspid would get if we were to fill the crown with gold or other hard substance and leave it too full, or such as it would get if an individual tooth were harder than the other and thus less subject to wear by attrition.

Now there is nothing new in all this, and yet I fear there are some among us who do not give sufficient attention to—if I may be allowed the expression—the harmonious antagonism of the teeth, especially in cases of obscure pain.

A year ago a lady of middle age, with full complement of teeth containing several fillings, all of which were gold, complained of uncomfortable feeling in the region of the upper left molars. I examined

them but failed to find the cause. A week later she came in with "there must be a cavity in one of these teeth, as hot and cold liquids give me severe pain." I spent half an hour in a further examination. The verdict was—no cause for action. A week later and a draught of air through the mouth gave pain. Then for the first time I found sensitiveness to percussion in one of the bicuspids. I suspected a dead pulp, as it contained a good filling of fifteen years' standing. A few days more showed marked periostitis. From a bite upon sheet wax I found the tooth receiving hard knocks from a hard, unworn cusp of its antagonist. I ground away the hard-headed antagonist with instant and permanent relief, and there has been no discomfort whatever since the hyper-sensitive tooth was relieved of more than its share of pressure.

Four years ago I removed the pulp from a lower molar for a man of about fifty years, and filled the roots with os-artificial and the crown with amalgam. Last January he came in saying: "That tooth will have to come out now." He had lost but two or three teeth, and the others showed extensive wear, excepting this one. By a bite upon sheet wax I found it to be receiving more pressure than the others; it was a severe case of periostitis, and increasing daily. I ground the tooth so that it scarcely touched, and he remarked: "There, that is all right," and it has remained all right to the present time.

In February last a young man applied for relief. He had lain awake nights, and suffered daily after eating for more than a week. I could not locate the pain, as it was neuralgic in character, but after several days had passed, during which I made four or five examinations, a lower second molar began to grow sensitive to percussion. It had been filled seven or eight years with amalgam, and now showed a cleaner cut through sheet wax than its neighbors. I applied the grindstone cure, and there has been no discomfort since.

In February a man of forty-five, who had been unable to attend to business for a week because of a sore tooth, came to have it out. A lower second bicuspid was jumping up and down in its socket, and I at first thought there was alveolar abscess. A further examination led me to think there was not, and that the pulp was alive. I applied the grindstone cure, with immediate relief and a rapid return to health. He was employed in the city treasurer's office, and it was a plain case of unequal taxation, and the overtaxed member grumbled, as it had an inalienable right to do.

Between two and three weeks ago a man of fifty, who lives in Chicago, but who was spending a few days in our city, called and wished me to examine an upper second molar. It had troubled him a good deal for three or four years. He had thirty-one teeth, all nearly sound, three or four small fillings in them, and an amalgam filling on the posterior side of the troublesome one. The wisdom tooth back of it had

been extracted about four years before. He said it was not sensitive to heat or cold, but most painful after eating. His dentist said he could do nothing except to extract it. I found the filling perfect, the tooth otherwise sound, and the gum apparently healthy. I ground it and its antagonist, and requested him to report the result. I have not seen him since, but a week afterward received a postal card saying his tooth was all right, and that he had had no pain since the application of our specific.

Three months ago a lady began troubling me with complaints of toothache, for which I could find no cause. The trouble gradually increased until about a month ago, when she came in, saying she had suffered so much that she could bear it no longer, and that cold water gave excruciating pain. With a syringe and cold water I soon found the offender to be an upper second molar, in which an approximal filling of phosphate of zinc had been inserted a year or two before. The filling was in good condition. I ground the tooth so that it did not cut through sheet wax. I did not see her again until yesterday, when she came in smiling all over, saying she thought it wonderful how such a simple thing had cured her of the "awfulest toothache" she had ever had.

These are only a few of the many cases, but sufficient to show the point I wish to make. We do know that teeth often differ individually in the same mouth in structure and density, with corresponding differences in their ability to withstand wear. As a general rule, however, they accommodate themselves to circumstances, and keep up the balance of antagonism unassisted; yet I have been astonished at the number of cases I have found since I have been looking for them, where a little assistance was needed, and which, when rendered, met the requirements of the case perfectly.—*7th District Dental Society, N. Y.*

At the first annual supper of the Collegiate Department of the Chicago Dental Infirmary, Dr. Swasey, the president, reported: "This institution is the only one of its kind in the world, and is in the nature of a hospital where the poor can be treated free, and where materials are furnished at cost. At present the institution has eighteen matriculants, who graduate after the second year, having first to pass through a regular course of study. It was only opened on March 1, and promises to be exceedingly beneficial and elevating to the dental profession of Chicago and the West. During the course there has been delivered by members of the faculty over two hundred lectures on the subjects of pathology, therapeutics, dental surgery, prosthetic dentistry, materia medica, anatomy, chemistry, etc. The infirmary had been open, and would continue to be throughout the year, under the supervision of competent demonstrators in both operative and prosthetic dentistry."

CASE IN PRACTICE.

BY ROBERT LEWIS, MACON, MISS.

Patient a young man, aged twenty-seven years. Applied for treatment July 18, 1883. Face swollen in region of antrum of Highmore. Constant and excruciating pain over side of the face. After examination, we proceeded with the following operation:

Two longitudinal incisions parallel with alveoli, after which we removed a very wonderfully constructed and curious osseous growth or formation. We could not term it an osseous tumor, from the fact that it differed from those abnormal bony formations which we often meet and term osseous tumors. The structures, four in number, were very characteristic and distinct. One portion presented a seeming semi-vitrious substance, of a pearly milk-white color, extremely smooth and glossy on its surface. The substance of this seemed fibrous, the fibres radiating from center to surface. These fibres were placed one beside the other, with occasional narrow angular fissures, or inter-spaces, which are largest and most numerous near the soft, bony-like portion, which I will presently describe. These inter-spaces form prisms, which come in direct contact with the soft or bony portions, and are fixed in shallow depressions of the soft part.

Now the next and slightly softer part is not crystallized, as the above described substance, but contains more of the animal matter or less of the lime-salts. It is tubular, the tubes radiating from a still softer part, which we find in the center of the mass. The tubes are directed perpendicularly to the surface—from the center to the surface—pursuing a wavering course, each tube averaging three curves. Besides these cardinal curves, under a high magnifying power we find smaller and secondary undulations. These undulations are nearly parallel in different tubes, thus giving rise to the appearance of concentric lines around the center of the softest part of the mass. These secondary tubes terminate in minute cells and form a cellular portion. Around the lower part of this last described structure we find another and third and similar substance, more highly organized, softer, and in which the cellular formation predominates.

The fourth and softish tissue of this wonderful growth we find in or near the center. Soft, highly organized, with nerves and blood vessels, we find it a peculiarly delicate tissue. Resting beneath the hard, flinty and crystallized substance first mentioned, we have it to enter the second or softer structure mentioned by three canals, having exit through the same number of foramina. Through these it seems to be intimately connected with the fifth pair of cranial nerves, and by or through the trigeminous with various other nerves supplying the head and face, too numerous to mention. This intimate connection with

the above nervous system is the reason I give for the swollen face and excruciating pain.

I trust this will reach many readers through your journal, and cause a thought from each which will prove of value, not alone to us as a profession, but to the people at large. I am happy to say that my patient is now in the best of health.—*Southern Dental Journal.*

RIGGS' DISEASE AND INFLAMMATION.

BY H. W. ATKINSON, NEW YORK.

If I were to give a prescription to prevent Riggs' disease I would say: Let children chew hard substances from the time their teeth are erupted until they cease to need the use of them. The debility, in my estimation, is introduced through the door of the inaction of the masticatory apparatus, in all instances. The same thing holds good in hypercementisis, or those cases that have been presented under the name of exostosis of the roots of the teeth. We cannot state much that will amount to anything as to apprehending the nature of the case unless we understand the coalescence of the seen with the unseen. We must know how soft pabulum is converted into the various tissues, and what the process of tissue-building and tissue-feeding is, before we can arrive at any competent conclusion in such cases, and if it were not that our affections lead us further than our intellects, we would make a pitiful showing before any competent jury in diagnosing these questions. We have the amalgam question here, and the amalgam question is not an amalgam question at all, any more than pain in a tooth is tooth-pain. It is the mercury in the amalgam (if amalgam ever does any mischief) which produces salivation and inflammation in that neighborhood, that has been called inflammation of the periosteum. Almost all the testimony in reference to it is misleading. We do not understand that the inflammatory process for the reproduction of tissue is a reversal of the nutrient activity that originally built the structure. Those men who have seen a section under a microscope go on blundering and talking baby-like nonsense, jumping from one category to another as if there were any real relationship between them; as if it were possible for a dead substance to be absorbed into a living, or into the canaliculi of the cementum, as mentioned by many. In the embryonal corpuscles, constituting the neural contents of the cancelli in the soft bone, the seeker will find oil globules, but I will give him a Delmonico dinner if he will show me oil globules in any normal bone exostosis, as he calls it. We are too much involved in deep water in these investigations to permit us to satisfy the queries of individuals who have stolid convictions and surface intellects, and who let their discriminations entirely go by the board. In the pathology and sur-

gery of the past, in the text books that have been written, the teachers dwelling upon the inflammatory process have talked about matters that have been expunged long since, but still some men hang to them. We say antiphlogistic. That term occurred from an apprehension that there was something in an inflamed part that was called phlogiston, that was producing the mischief; and they were right. It was a slow burning, and that which caused an allaying of the burning was called an antiphlogistic. It is really an oxidation of the elements, one which produces—what every other fire does—ashes, carbonic acid gas, and water. Such is the work of every inflammation, as veritably as there is combustion in the fire-place. Hence it is just as accurate to say "shin-pain" as it is to say "tooth-pain." If you say pain in a tooth, I will accept that. I have the same objection to the term neuralgia. All pain is perceived through the nerves, and must be neuralgic, must be pain, *per se*, in the nerve. We are dealing with a profound subject when talking about pain, that is true. Pain is not inflammation, and inflammation is not pain. It is a disturbed condition of the nutrient activity whereby a reversal of the nutrient process has taken place, and the elements of the tissues become reduced back to their embryonic character. Where this inflammatory process is going on the tissues swell and press against the nerve tracts, dividing the waxy material, or neurine, which is the conductor of the nerve currents, so lessening its capacity for conduction that it cannot convey the full current with a sufficient degree of celerity, and then it becomes pain. It is like driving a flock of sheep over a bridge that was intended to take two or three abreast, but which has been reduced so that one or two only can pass at a time, and they become crowded. It is a crowding of the currents of nutrient activity of the sensory nerve that produces pain. They *are* profound questions, but they are perceivable and understandable if we would give them the attention that we give to many other things of our lives; and with proper attention to them we would make fewer blunders and be less dogmatic in our statements. Many times a pain is raised that is nothing but reflex action, or, if that is not understood, sympathetic action with the seat of the mischief, and hence we refer the pain to a seat in which it is not. I have had patients ask me to extract a lateral incisor, saying they knew what tooth they wanted out, and, after an examination, and being unable to find any trouble in that tooth, I have found, perhaps, a third or a second molar with a cavity in it, and when I touched it they would say, "there, I told you so, now take it out." They were deceived by a process of reflex action which seemed to locate the pain in another place than the real seat of the trouble; the question was too profound for them, they did not see the relationship of things, and did not mentally interpret rightly the cause of the trouble.

Remedies have been spoken of, and some have been named, and I can testify to their efficacy,—I beg pardon—I can testify to the relief of pain after the application of the remedy; I cannot say that it was the application of the remedy that brought the relief. Why I cannot say that is because I at one time applied a remedy which was not the one at all that I thought it was, and it cured the patient, or, at least, the pain ceased when I applied it. What was it that relieved the pain in that case? I just put a little water into the cavity, thinking I was putting in a potent agent. Was it the intention, the purpose on my part, or was it the expectancy of the patient that soothed that pain so that it did not return? We ought to be a little careful about deciding what is a remedy and what is not until we understand more about the molecular changes which take place in health and disease. We will then be better able to discriminate what remedies to use for the relief of pain, and we will be better able to talk intelligently of these matters than we have been heretofore. It was said that sweets cause the teeth to ache where the dentine is exposed, irritated and softened. Retrogressive metamorphosis of tissue bad been set up, and the lime-salts dissolved to a certain extent, and if you apply sweets, such as sugar, in such a case, the pain is aggravated. Now, how does that aggravate the pain? And if, while the pain is severe, you put some pure glycerine into the cavity that has been cut down to the solid dentine, it will produce a sharp, stinging pain. How is that brought about? It is caused by the affinity subsisting between the water in the tissue and the glycerine, the hunger that the glycerine has for water. Therefore, if you so use glycerine, always satisfy its hunger for water before applying it to the sensitive, living substance of any of the tissues of the body. The great obstacle to our regular growth is the assumption that what we have already attained is final. We think we have attained the whole truth, when, in fact, we have only attained the truth so far as we have gone. We give ourselves the credit of understanding beyond what we do really understand, beyond what has been properly thought out.—*N. Y. Odontological Society.*

Do you want to see a metal become heavier without anything visible making it become so? Take a horse-shoe magnet and gather on the ends all the fine iron filings that will stick. Slip off one of the trays from your scale beam and hang the magnet in its place. Now balance it by weight in the remaining tray. If you place an alcohol lamp under the iron filings and light it the filings will be consumed. Will you find that you lose weight in proportion to the amount of the iron burned? No; there will be a greater weight than before the burning, for it has taken oxygen from the atmosphere. Is it not strange that this amount of oxygen should add perceptible weight?

THOUGHTS UPON SOME QUESTIONS AFFECTING THE PROFESSIONAL STANDING OF DENTISTS.

BY DR. L. C. F. HUGO, WASHINGTON, D. C.—ABSTRACT.

The dental practitioner of to-day recognizes that there is something seriously wrong in dental education. The dental colleges, though censurable in many respects, are the victims of most unfavorable circumstances, but they are doing as well as ought to be expected. The standard for graduation is low, because the requirements for admission and graduation must of necessity be few, in order that the average capacity of the candidates may be accommodated, and because the colleges do not enjoy the benefits of statutory protection. To remedy these evils the dentist should see that the young man whom he takes under his pupilage has, at the least, a thorough common-school education. The preceptor should then remember that it is his duty to teach in the laboratory as well as in the operating room, rather than to let the pupil find out. The pupil should enjoy the crystallized results of the best experience. If preceptors would do their duty by their pupils, the colleges would have students who could accept higher and more thorough instruction, and of whom a stricter and more comprehensive examination could be demanded. The colleges should be protected by legislative enactments. Twenty States have made a step in the right direction by enacting laws which require the dentist to possess a diploma or a license. And yet they have not gone far enough for the good of the profession at large; *every dentist ought to have a dental diploma.* Would it not procure for us professional entity if there were but one *recognized, legitimate* way of becoming a dentist? When all dentists are obliged to be *dental graduates,* all the evils of dental education, private and public, will be concentrated in one place, where they can be vigorously and effectively blotted out. In the present lax condition of affairs, from want of proper protection, our colleges are reduced to a quasi-commercial competition. Once their independence is secured by laws compelling all incoming practitioners to possess dental diplomas, the faults of the colleges could be attacked without mercy, and be forced to yield to the demands of a rapidly progressive science; the course could be lengthened to three years, the curriculum could be made more comprehensive and be more thoroughly taught, so that a student, upon graduation, might be prepared to begin the practice of oral surgery and oral prosthesis. The endowment of the colleges would be of great benefit in confirming any progress made by the reforms first spoken of. The endowed institutions of the legal, medical, theological, academical, and scientific world maintain the highest standard. —*Southern Dental Association.*

ARTICLE 1.

"NAME FIVE OF THE PRINCIPAL TISSUES OF THE BODY."

PREPARED FOR "THE ITEMS OF INTEREST" BY W. S. ELLIOTT, M.D., D.D.S., GOSHEN, N. Y.

At the late meeting of the National Association of Dental Examiners, Dr. Cushing submitted a list of questions prepared by the committee appointed at the conference in February last, and moved that "the standard be raised twenty-five per cent over that indicated by the questions."

It may be interesting and instructive to those who would become candidates for professional honors, to review some of these questions, and to elicit such answers as may be deemed sufficiently comprehensive to meet the requirements of the honorable board.

The list starts out in the department of anatomy:—"Name five of the principal tissues of the body."

Before an intelligent answer can be given to this question, we would naturally make inquiry as to what constitutes a tissue.

As defined by Dunglison, it is "the various parts which, by their union, form the organs"—being "elementary" and "compound."

This is not sufficiently specific to form any idea as to the distinctions to be made.

Todd and Bowman describe and classify the tissues as follows:

1. Simple homogenous membrane; as, the posterior layer of the cornea; the capsule of the lens, etc.
2. Filamentous structures, white and yellow; as, periosteum, ligament, tendon, and the middle coat of the arteries, vocal cords, etc.
3. Compound membranes—skin, mucus, serous and synovial.
4. Adipose, gray nervous.
5. Selerous—bone, teeth.
6. Compound—muscle, nerve and fibro-cartilage.

Atkinson's formula is as follows:

1. Confluent—nerve mass, differentiated into fibrous and vesicular.
2. Limitory—elastic and non-elastic fibre.
3. Motory—voluntary and involuntary muscles.
4. Secretory—glandular organs.
5. Statical—bones, teeth and shells.

Haller and Blumenbach include all the structures in three classes, nominated as follows:

1. Cellular or laminated.
2. Nervous, pulpy or medullary.
3. Muscular.

The latest classification admits four kinds of primary tissues:

1. Muscular—Striped and unstriped.

2. Connective—Myxomatons, (represented in tooth pulp and umbilical cord) fibrous, chondrogenous and osseous.

3. Neural—vesicular and fibrous.

4. Epithelium—skin, mucous membrane, etc.

It is evident, from the above showing, that the term "tissue," as contained in the question propounded, is to be taken in a very general sense, and is made to refer to any important section of the body—as, lung tissue, blood tissue, muscle tissue, bone tissue, nerve tissue, gland tissue, etc.

A true understanding of what constitutes tissue is evolved only from the conception that all the named varieties are transitional or differentiations of a primal form of living mass first presented to the senses under the aspect of *protoplasm.*

For convenience of study these various schemes of classification have been adopted and formulated, according to the degree of understanding of the modes of progression in the tissual elements, and the demands of function. Arbitrary divisions are departures from the unified purpose which pervades all the parts to the end of totality of requirement in a perfected body.

We speak, perhaps, with a broader estimate of the value of the principles involved than is demanded by the occasion; but, surely he who would advance to a profounder understanding must necessarily look into the very heart of the processes which constitute life and its progressions, and thus make clearer the way along which we would travel toward the goal of ultimate truth.

The mere memorizing of names gives little evidence of acquirement. Mass knowledge leads to indefiniteness of purpose and indecision of effort, and it is only through the discriminations of earnest thought that the subtleties can be grasped and made the instruments of our desires. And though these generalizations are approached as conditions, perhaps, necessarily incident to the entry upon a professional career, they should not be deemed equivalent to the demands which must enforce themselves upon the practitioner in a continuance of his work. Study, then, should not cease upon admission to the ranks of the profession, and although the curriculum be honorably passed, there should be no rebate in the determination to master the situation in any emergency.

We unexpectedly are able to commence in this number the series of articles explanatory of the questions of the National Association of the Board of Dental Examiners. We are confident this will be of great value to dental students, and to those in the profession who have not had the opportunities of a liberal education. Dr. Elliott, the author, is well known as a ripe scholar, and a plain, terse, practical writer.

Editorial.

NUMBER II.

SOME ITEMS OF INTEREST IN PHYSIOLOGY.

The formation of tissues from molecules is a process not easily described. In fact, our knowledge of it is very limited. These little germs seem to be strung something like beads on a string. And yet, as we look for the string, it is not there. As they place themselves in many rows to form a fibre, we find a strength and cohesion and resistance to pressure, but no cause for either. Each fibre seems to have a coat, but the more minutely we examine it the less defined we find it, yet we see shape, regularity, and other mechanical and physical properties, which forces us to admit that there is definite organization. These fibres are formed into a variety of tissues, and these tissues into a variety of membranes, muscles and organs.

THE STRUCTURE OF THE MUSCLES.

The muscular structures are composed of these fine threads arranged in various ways to form strings of strong fibrous tissue. Some of these threads are very elastic, others quite inelastic, according to the purposes for which they are designed. Some are in very large bundles,—bundles of bundles, huge in form and extreme in strength—others are wonderful for their delicacy and minuteness. In one form these delicate fibres are called

CONNECTIVE TISSUE,

because it is found without break throughout the body. As, for instance, the skin is connective tissue. The thin membrane covering all surfaces within is the same, slightly modified. Notice the skin as it comes to the lips. How it gradually changes its appearance till, on the inside of the lips, it has entirely changed from skin to the thin coating we call mucous membrane. It bears no resemblance to the skin, and yet the only difference is that the outer coat of the skin is dried into what we call the scarf skin, and the mucus which constitutes this in the inner membrane is not dried. This connective membrane is sometimes called

CELLULAR TISSUE,

because these threads of which it is composed, as they cross each other, produce little spaces, or cells, which are filled with various substances. It takes on different names, according to the character of these materials. When these spaces are filled with fat, the membrane is known as adipose tissue; if with mucus, mucous tissue; if with serum, serous

tissue; if with lime, bone. Thus this cellular tissue is the frame work of bone; that is, this cellular tissue assumes the form of the bone, and its interstices become filled with this lime to constitute its hardness. By what power this curious tissue has the instinct to know in what particular part to draw in lime to constitute bone, where serum should be invited to form serous membrane, and where it should provide for the deposit of mucus to make mucous membrane, etc., is a mystery. But so it is. We find no cellular tissue filled with lime where there should be mucus, nor mucus where there should be serum, etc. In all parts, though it is one membrane, it varies from these circumstances much, in shape and character.

THE MUSCULAR MEMBRANE

is that soft, flexible tissue of which the heart, the liver, the kidneys, etc. are composed, and also the substance of which the skin and some other tissues are constructed. But there is this difference: The former are considered involuntary muscles, because they act without the will; the latter are known as voluntary, because they are more or less under the control of the will. The muscles of the arm, called the biceps, for instance, are voluntary, because when we will it, the hands are drawn to the shoulder by them. The elevator, major and minor of the lips are voluntary, because, by an exercise of the will, the lips are closed by their contraction. The stomach and the kidneys are composed of involuntary muscles, because we cannot affect them by the will. How can we distinguish them by their construction? If we look carefully, by the aid of a microscope, we shall find in the voluntary muscles distinct transverse markings, while in the involuntary these do not appear. Further differences will be mentioned as we describe more specially the muscles of the internal organs and those of motion. The bundles of fibres of which both are formed are of various shapes, sizes and lengths, thus giving them specific character and force.

Crystals as Ornaments for the Office.—Boil clean sal soda in just enough water to dissolve it and pour it into a glass jar. This will quickly crystallize on cooling, either upon the sides and bottom of the jar or upon any formation of threads, wire, or wood put into the jar.

Beautiful crystals of alum, sulphate of copper (blue vitriol) or other solvable minerals may be used. As each of these give differently formed crystals and some of them of different colors, nice combinations may be formed. As, for instance: The alum is transparent and the copper sulphate is blue, and each different in form of crystals. The contrast, as they crystallize side by side, is very pretty.

Strip a piece of zinc up and twist it into the form of the trunk and branches of a tree or other form. Place this in a glass jar, and pour in water saturated with sugar of lead. This mineral will soon form on the zinc in beautiful and fantastic forms.

The phosphate of zinc does not seem to be appreciated yet by some dentists. Where the decay of a tooth has nearly or quite encroached on the pulp, if the cavity is excavated ever so skillfully and delicately, and filled with gold, or even with alloy, the operation is generally a failure; but if oxyphosphate is used, according to directions, the result is almost always a success.

This filling is now so good and durable that it will generally wear very well,—in some mouths for a long time—though it be not covered with metal. Yet it is well to depend on it to mainly fill the cavity, the surface to be plated over with gold, or the gold and platina alloy.

This process is not only safer, as preventing immediate bad results and in healing inflamed pulp, but it better preserves the tooth. The oxyphosphate is so absolutely non-shrinkable, and so tenaciously adheres to the walls of the cavity, that it is our most impervious filling. And it is such a non-conductor that the tooth is not so sensibly affected by thermal changes.

Such a filling is not only better, but much cheaper. A cavity which filled with gold would cost from ten to twenty dollars, can be filled better and more durably, in the above way, for from four to ten dollars. Even as compared with a large alloy filling, the oxyphosphate is so much cheaper that it is economy to fill the body of the cavity with this and finish with the alloy.

The profit to the dentist, if he value his time and energies, is also in favor of the new mode. The old entire gold process is the most tedious and exhaustive of all the operations in dental manipulations.

Then, too, we should take into consideration the comfort of our patients. We have all seen how perfectly exhausted they become during the tedious operations of extensive gold fillings. An intelligent patient would far sooner pay the same price for as good a filling, which could be put in the tooth in one-fourth the time.

If we are contented with the mere playthings of life, and bask in the sunshine with neither thought nor anxiety, we shall, like children, magnify little things till we think them of great importance. We shall quarrel over them and contend about them as children dispute concerning their mud pies and play-houses on the sandy beach which the ocean's waves so soon sweep away. Trifles will so employ our thoughts, control our time, modify our tempers and absorb our lives, that we shall have neither strength nor disposition for anything great and noble.

An Amusing Experiment.—Mix equal parts of nitric acid and sulphuric acid. Pour a little into a cup containing turpentine. A beautiful violent flame will so suddenly shoot up as to make almost an explosion.

THE COMPOSITION OF DIFFERENT AMALGAMS.

Under this head the *Independent Practitioner* has an article quoted from a German magazine professing to give the composition of different amalgams. We are a little surprised that the intelligent editor of the *Independent* should have given added circulation to such a medley of nonsense. Several amalgams are quoted as containing gold, the manufacturers of which have never claimed a particle of gold. Even "Townsend's improved" is credited with 5.31 per cent! when all who are familiar with its formula know it contains none. Most of the amalgams quoted are said to contain as high as 60 per cent of tin. We doubt if any dentist could be imposed upon by any such compound; and yet one amalgam is said to contain 66.75 per cent of tin. Our best amalgams and alloys contain but a minor percentage as a flux. The author tells us that Lawrence's amalgam contains nearly 15 per cent of copper. Let any one who believes this add even 10 per cent to the best amalgam on the market and see its effects. One amalgam is said to contain iron. The man might as well tell us it contained a meteoric stone.

A Substitute for Celluloid.—A new material has been invented. It is thought it will supersede celluloid. It possesses all the hardness and brilliancy of the latter, and has the advantage of being fire proof. It is made in this way: A solution is prepared of 200 parts of casein in 50 parts of ammonia and 400 of water, or 150 parts of albumen in 400 parts of water. To the solution the following are added: Quick lime, 240 parts; acetate of alumina, 150 parts; alum, 50 parts; sulphate of lime, 1,200 parts; oil, 100 parts. The oil is to be mixed in last. When dark objects are to be made, from 75 to 100 parts of tannin are substituted for the acetate of alumina. When the mixture has been well kneaded together and made into a smooth paste, it is passed through rollers to form plates of the desired shape. These are dried and pressed into metallic moulds previously heated, or they may be reduced to a very fine powder, which is introduced into heated moulds and submitted to a strong pressure. The objects are afterward dipped into the following bath: Water, 100 parts; white glue, 6 parts; phosphoric acid, 10 parts. Finally they are dried, polished, and varnished with shellac.—*Tradesman.*

A crowded condition of the teeth is one of the most prolific causes of decay. Those whose teeth are a little apart are seldom troubled with tooth decay, for they are self-cleansing. In the treatment of all teeth, therefore, this fact should be kept in mind, and the teeth left so as to prevent, as far as possible, the enforced retention of food between them.

Vivisection.—Dr. L. C. Lane says: Bell's great discovery has shown us how local injury in the nerve centres can deprive a separate portion of the body of the power of feeling. And this great truth was brought to us through the aid of vivisection; and without vivisection it is fair to state that Bell's discovery could not have been made. Yet governments are besieged by modern sentimentalism to intervene and close up this valuable route, in fact almost the only one that leads to yet unknown verities in the sphere of animal life. Governments do not hesitate to sacrifice armies of men—mutilating them in body and limb, and killing them often in the most brutal manner—in defence of some strip of soil or some commercial right; yet unthinking pity and narrow benevolence can behold all this cruel sacrifice in silence, and become noisy in its clamors of commiseration when life may be saved and pain spared to millions of its own kind by the destruction of a few hecatombs of the inferior animals. Pity, though one of the noblest qualities of the human heart, when unguided by the light of reason, can easily wander into extravagant excesses.

Rapid work is generally supposed to be the more painless. It will appear from the following that Dr. Jennings thinks otherwise. He says: In preparing cavities the engine is indispensable, but I am sorry to say that it is a much abused and misused friend. If the driving power was reversed on them I think the patients would rejoice; that is, if the pulley was the driver and the driver the pulley. It is simply terrible, the velocity at which some run the engine. It is a thousand times more painful and does not cut near so fast as when run slower. To illustrate: A bur is but a rotating file, and if they will take a file and run it fast across a piece of soft steel and then slow, and see the difference in the cut, I think they will, for their own convenience and benefit, run it slow ever after when they are excavating with it, and as far as the pain is concerned it will not be anywhere near as severe. A bur run rapidly hurts much more from the heat generated than it does from the cutting. I would say one thing more regarding the use of the engine in excavating. Always put your bur as near the nerve when you put it on the tooth as you expect it to be, and then draw it toward the enamel, and by so doing it will be less painful, for the reason you have cut off the tubuli near the nerve and it loses its sensitiveness to a great extent.

The following States have passed dental laws: Alabama, Georgia, Illinois, Indiana, Kentucky, Louisiana, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina and West Virginia.

If there are others, we shall be pleased to know.

Bleaching Teeth.—Dr. E. H. Stanley, of Little Falls, Minn., asks for information. Saturating the cavity of a discolored tooth with the spirits of camphor is good. Put on the rubber dam; allow the camphor to remain in the cavity fifteen or twenty minutes, then renew once or twice. Now fill the cavity with cotton moistened with the camphor, and cover with sandarach varnish and remove the rubber dam. The tooth will generally be found decidedly lighter in a few days. Sometimes it will lose its stain immediately, so that it can be filled at the same sitting.

But all cases of discoloration cannot be removed by the same agent. Chlorine is sometimes better than camphor. In a large number of cases it will be found very prompt in its good effect. Diluted nitric acid will bleach some teeth that other remedies will not effect. If chlorine is used, its best preparation is Labarr Acques solution of chloride of soda, or of lime. Remove all the discolored dentine of the walls of the cavity. Now touch to a little powdered alum a pellet of cotton saturated in the solution, and immediately carry it to the cavity; allow it to remain ten or fifteen minutes. Generally this has to be repeated two or three times, the cavity to be washed and dried between each application. If the last cotton is covered with sandarach varnish and allowed to remain a day or two it is better, when the same process may have to be repeated, though not generally. The alum is used to produce a chemical action, which liberates the chlorine—thus causing a nascent action more powerful and active than when the chlorine is used alone. For a permanent filling the phosphate of zinc of a light color is better than gold; of course, the zinc must be plated with the metal.

If the nitric acid is used, the cotton saturated with it should be left in the cavity only from two to five minutes, and after the bleaching is finished, the cavity should be washed with ammonia.

If either of the above agents are used with the caution above indicated there need be no fear of injuring the tooth.

Perhaps some of our readers have a still better mode.

The irregularity or even crowding of the front under teeth in childhood is not such an evil as is often assumed. It is seldom they become decayed from over crowding, and the irregularity generally "takes care of itself." They may not entirely straighten themselves, but will generally sufficiently "come into time" to obliterate any dissight. Yet we have known dentists to extract bicuspid teeth, and even cuspid teeth, to give these front teeth room. It is almost always a failure, and sometimes a positive injury to the after symmetry of the features.

THE MINUTE STRUCTURE OF THE TOOTH.

It is well, occasionally, to have our attention drawn to the minute structure of the tooth, though it may be still controverted ground. Dr. Bodecker, of New York, is one of our most thorough and successful investigators of this subject. With regard to the tooth's vitality, the doctor thinks the position of Franz Boll is correct; namely, that the tooth pulp is richly supplied with arterial, venous and nerve filiments, and that the odontoblasts (the dental fibres, or formative part of the tooth structure at the periphery, or outer portion of the pulp) are medullated nerve fibres.

The outer surface of the pulp, he says, is surrounded by a layer of medullated (marrow-like) corpuscles, which are termed odontoblasts, irregular in form and made up of two, three, and sometimes four corpuscles, arranged in a row and connected by fine off-shoots. In the vicinity just beneath the odontoblasts he finds the meshes of a fine tissue called myxomatons, where also are a few small blood vessels. "Here," he says, "between these corpuscles the dental fibres have their origin, and this is also the case in the formation of secondary dentine. I have traced these dental fibrille up to, and some of them between the odontoblasts in connection with their lateral off-shoots."

Distinction must be made, he informs us, between the dental fibres proper, and the prolongations of the *medullated* nerve fibres. The medullated nerve fibres are usually seen in bundles running in the direction of the periphery of the pulp, but gradually separating into numerous fine fibrille.

A Union of Dental Colleges.—Now that State Boards of Dental Societies are uniting in a National Association for the uniformity of a standard for examination, it will be in order for the various Dental Colleges to see what they can do in the same direction. That *some* action in this direction is desirable is without question, and that the time to take the first step has arrived is without doubt. What is needed and who shall inaugurate the movement may not be so clear.

A few practical suggestions in our dental journals may be a good preliminary preparation. Among all the reforms this might bring about we should hope to find on the part of students better discipline, the requirement of more uniform attendance, and the actual study of each day's lectures and demonstrations; while on the part of the professors there might be a gain in the elevation of the moral, intellectual and professional standard, a more specific, thorough, and practical teaching, and that constant determination to at least keep abreast of the best thoughts, discoveries and demonstrations of the profession.

Miscellaneous.

ITEMS IN CHEMISTRY.

BY H. E. ROSCOE.

COAL.

Coal is the remains of plants which grew long ago on the surface, but which have been buried down deep in the earth. When you go down a coal-pit you will see the roof and floor of the passages covered with impressions or casts of leaves and other parts of plants, showing that plants have been buried here; and if we slice a piece of coal very thin indeed, we see in the coal itself marks which show us that it has all been vegetable matter.

MANUFACTURE OF COAL GAS.

Powder a little coal and put it into the bowl of a common long tobacco pipe; then cover the top well with a stopper of moist clay, and let the clay dry. After it is well dried, fasten the bowl of the pipe over the flame of the gas lamp. Soon a yellow smoke will come out at the end of the pipe, and this yellow smoke will burn with a bright flame when a light is brought to it. This smoke is coal gas, but not purified like that which we burn in our houses. Now push the end of the pipe under water; you will see that bubbles of gas come off, and if you place a test-tube full of water with mouth downwards over the end of the pipe, the bubbles of coal gas will collect, and the tube may be filled with gas, which will burn when you bring a light to it.

All the coal gas which we use in our towns is made in this way. Instead of tobacco pipes, large ovens made of brick or sometimes of iron are used, and these are called retorts; instead of a pinch of coal, many thousands of tons are made into gas; instead of a test-tube to collect the gas in, enormous gas-holders made of iron plate are used.

When the pipe is cold take off the clay, and you will find some grey coke in the bowl; this is some of the pure carbon of the coal which is left behind. Some of the carbon and all the hydrogen of the coal has gone off as gas, or water, or tar, for all these things are formed when coal is distilled or heated as we have done.

There are many different kinds of coal, some of which are not so good for gas making as others, because some contain more carbon and less hydrogen than others, and therefore give less gas and more coke.

Beside coal gas, we can get many other things from coal. Thus we get the tar which is used to tar ropes, sails, and fishermen's nets, to

prevent them from rotting in the salt water; also pitch, which is used for asphalting pavements; and, what is more wonderful, we get from coal those splendid bright violet and crimson colors, mauve and magenta. From the refuse water we get ammonia.

COAL GAS AND FLAME.

The flame of hydrogen coming from the coal gives off little light, whilst the flame of coal gas gives off much. A simple experiment with the Bunsen gas-burner will explain this. If you stop up the holes at the bottom of the lamp with your fingers, you will see that the gas burns with a luminous flame; if you remove your fingers, the flame loses its brightness and burns blue. This is because carbon or soot in a finely divided state is present in the bright flame, but not present in the blue flame. Hold a piece of white paper for a few seconds over the bright flame, it will be smoked; but when held over the blue flame there will be no smoke. In the bright flame the combustion (or burning) is incomplete, and solid particles of carbon are separated out in the flame, and cause the flame to be bright; in the blue flame all the carbon is at once burnt by the air which rushes through the round holes and mixes with the coal gas before the mixture burns at the top of the lamp.

The different parts of a common candle flame are well worth study. If you carefully look at the flame of a candle burning steadily you will see that the flame consists of three parts:

1. A blue, scarcely visible outer zone, or mantle, where the combustion is complete.

2. An inner bright or luminous zone, where soot is separated out and the light is given off, and where the combustion is incomplete.

3. A black cone on the inside, consisting of the unburnt gas given off by the wick.

The candle is, in fact, a small gas-works; the wax or tallow is the material which is distilled, the wick is the retort where the distillation goes on, and higher up and outside of this the gas burns.

You can show that this black cone consists of unburnt gas by taking a small bent piece of glass tube and putting the end into the black centre of the flame; the unburnt gases will pass up the tube and may be lighted at the other end.

THE PHILOSOPHY OF DAVY'S SAFETY LAMP.

Take a piece of common iron wire gauze, and bring it close over the lamp; then turn on the gas, and light it on the top of the gauze; next remove the gauze several inches above the burner; the flame does not pass through the wire gauze. Why is this? Because the metallic gauze so quickly takes away the heat that the gas will no longer burn.

Suppose now we were to place such wire gauze quite round a flame; we should see the flame burning inside the gauze; it would give light, and it would get air to burn through the meshes of the gauze; but no flame can pass through the gauze, and therefore if we take such a safety lamp into a mine where there is fire-damp, the gas in the mine cannot become lighted, because the flame cannot pass through the wire gauze. This is the reason why Davy's safety lamp has saved so many lives.

A TERRIBLE DEBAUCHEE.

HOW A LONG AND VIRTUOUS LIFE WAS MARRED BY AN UNGOVERNABLE INDULGENCE.

"No, I'm obliged to you, I don't drink," remarked Judge Gibbons, of Lancaster, in the bar room of the Girard House. "I am 63 years old and have never used tobacco in any form, never have tasted malt or spirituous liquors, never have been at a horse race or attended a circus or a theatre."

"Yours has been an exemplary life, Judge," remarked the *Times* man.

"Well, I don't know that it has," continued the Judge, sadly. "I am, after all, no better than other men; for the past forty-eight years I have been the abject slave to one ungovernable appetite. The indulgence has gained such absolute control of me that I cannot exist four or five hours without gratifying it. In the streets, at church, during family prayers, it torments me. I struggle against it. I resolve and re-resolve to break it off; but I am weak—very weak—and finally yield. I cannot go half a day without it. No, I daren't travel where I can't obtain it. It is killing me. Twenty years ago I weighed 220 pounds. Now I weigh 120. It is destroying my life, slowly but surely. I shall die of it."

"What form does this deadly dissipation take?" asked the reporter in amazement, prepared for an appalling confession.

"Mush and milk," was the solemn and humiliating rejoinder.

To make Rubber-Packing Air and Strand Tight.—The packing is brushed over with a solution of powdered rosin in ten times its weight of stronger water of ammonia. At first this solution is a viscid, sticky mass, which, however, after three or four weeks, becomes thinned and fit for use. The liquid adheres easily to rubber, as well as to wood and metal. It hardens as soon as the ammonia evaporates, and becomes perfectly impervious to liquids.

It is not always the strongest man who is the most successful in extracting teeth. Success depends largely upon the skill of lateral motions to loosen the tooth at the same time the direct motion is applied.

The Union Medicale is never so well pleased as when it finds the English and American medical journals accusing each other of representing a nation in which quackery is largely prevalent. It is particularly delighted when some new piece of charlatanism, brought to light in England, seems to give the Americans a temporary advantage. As a case in illustration of the latter condition of things, it gives the following: A charlatan, who had stationed himself near Westminster Bridge, informed the people that he had discovered the true test for consumption, and if any one suspected in himself the commencement of the disease, all he had to do was to breathe into the tube of water which he carried with him. He further related that, should the water remain clear after this operation, the breather's lungs were sound; but if it became cloudy, he had "the seeds of consumption deep within him." The spectators who breathed into the tube were all horrified to find the water cloud up at once, and the charlatan explained that these clouds were caused by "the germs of disease." He would charge nothing for the trial, but he had a medicine which he would solemnly recommend them to purchase ere it be too late. As a proof of the effective nature of the cure, he would now pour a few drops of the liquid into the tube. Upon doing so the liquid became perfectly clear again, and this, said the quack, was "precisely the way it acted in the human system." Of course he found many purchasers, as his experiments were most ingeniously calculated to deceive. The true inwardness of his interesting process lay in the fact that the water in the tube was lime-water. As all the air which we exhale contains carbonic acid gas, the liquid became surcharged with it, thus making a portion of the lime in the water insoluble and rendering the liquid cloudy. The addition of a few drops of the "medicine," which was slightly acidulated water, restored the dissolving power of the liquid and made it clear again. It is hardly to be wondered at that the symmetrical beauty of this piece of scientific quackery attracted the notice of the vivacious French editor.

Ed. Items:—For many years I have known that a few drops of cold water thrown in the face would instantly remove nausea, at least for a short time. Many times I have used the idea in taking impressions of the mouth. A few days ago, while administering ether, I saw a nice prospect of a vomiting spell. After the patient began retching severely, I threw a little cold water in the face. The retching instantly ceased, and by repeating it a few times vomiting was prevented till I had extracted fifteen roots. A day or two afterward I had a similar case with the same result. Those two patients were apparently beyond consciousness.

H. F. Douglas,
Fenton, Mich.